LISTING OF CLAIMS

1. (Currently amended) A method of producing a stream of charged particles in a low pressure environment that comprises ~~includes~~ the following essential steps:

(a) supplying a flow of a non-corrosive and non-metallic liquid, said liquid having a vapor pressure below 0.1 torr at 20 °C, a viscosity coefficient below 2 g/cm/s at 20 °C, and an electrical conductivity greater than 0.04 S/m at 20 °C ~~relatively non-volatile and relatively inviscid conducting liquid~~ to a region maintained at a pressure below 100 millitorr ~~at low pressure~~ in which there is an electric field sufficiently intense to disperse said liquid into said low pressure region as a stream of small charged particles ~~droplets and/or ions~~; and

(b) providing one or more electrodes having configurations, potentials and positions such that all or a selected part of said stream of small charged particles ~~droplets and/or ions~~ will flow in a desired direction at a desired velocity;

wherein said small charged particles comprise charged drops, molecular ions, cluster ions, or mixtures of the foregoing.

2. (Currently amended) A method as in claim 1 in which the volatility of said liquid is low enough so that said liquid ~~it~~ does not boil or freeze when it enters said low pressure region.

3. (Currently amended) A method as in claim 1 in which said liquid has ~~a~~ an electrical conductivity between 0.1 and 100 S/m.

4. (Currently amended) A method as in claim 1 in which the properties of said liquid, the flow rate at which ~~it~~ said liquid is supplied into said low pressure

region and the intensity of said electric field are such that said liquid takes the shape of a Taylor cone-jet ~~the meniscus or interface between the liquid and said low pressure region assumes the well known cone jet configuration in which a thin jet of liquid emerges from the tip of a so called Taylor Cone whose base has lateral dimensions approximately equal to those of the exit cross sectional area of the duct from which said liquid emerges into said region containing said intense electric field~~.

5. (Currently amended) A method as in claim 1 in which said ~~relatively non-volatile conducting~~ liquid comprises a solution of an electrolyte in a solvent, and wherein said solvent is selected from the group consisting of ~~chosen from the class of compounds that comprises~~ amides, alcohols, glycols, esters, ketones, organic carbonates, ~~and~~ organic phosphates, and mixtures of one or more of the foregoing ~~these components~~.

6. (Currently amended) A method as in claim 1 in which said ~~relatively non-volatile conducting~~ liquid is selected from the group consisting of ~~chosen from the class of compounds that includes~~ ionic liquids~~,~~ and molten salts~~, and inorganic acids~~.

7. (Currently amended) An apparatus for producing a stream of charged particles in a low pressure environment, wherein said apparatus comprises ~~that includes~~ the following essential elements:

(a) a reservoir or a source of a non-corrosive and non-metallic liquid, said liquid having a vapor pressure below 0.1 torr at 20 °C, a viscosity coefficient below 2 g/cm/s at 20 °C, and an electrical conductivity greater than 0.04 S/m at 20 °C ~~relatively non-volatile conducting liquid of moderate viscosity~~,

(b) a region maintained at a low pressure, wherein said low pressure is below 100 millitorr, ~~at reduced pressure~~ and wherein said region is exposed to an electric field,

(c) a means for supplying a flow of said ~~relatively non-volatile conducting~~ liquid from said reservoir or said source into said region containing said electric field at a controlled flow rate such that the field disperses the ~~arriving~~ liquid arriving in said region into a stream of charged particles ~~droplets and/or ions~~,

(d) one or more electrodes positioned at appropriate locations and appropriate potentials ~~relative to those of the arriving liquid that will~~ to produce said electric field in said region and to ~~will~~ steer the stream of charged particles produced in said region exposed to said electric field so that ~~it~~ said stream of charged particles flows in a desired direction at a desired velocity away from said region with said ~~intense~~ electric field,

(e) power supplies ~~that will~~ to provide the voltages and currents necessary to maintain said electrodes at said potentials such that said electric field will disperse electrostatically said liquid into said stream of charged particles;

wherein said charged particles comprise charged drops, molecular ions, cluster ions, or mixtures of the foregoing.

8. (Currently amended) An apparatus as in claim 7, wherein said apparatus incorporates ~~including~~ a vacuum pump to create and maintain said region at reduced pressure.

9. (Currently amended) An apparatus as in claim 7, wherein said apparatus comprises ~~including~~ a means to control the temperature of said ~~relatively non-volatile conducting~~ liquid in said region containing said electric field.

10. (Currently amended) An apparatus as in claim 9, wherein said apparatus produces ~~operating as a source~~ primarily ~~of~~ ions, ~~where~~ wherein said liquid at said controlled temperature has an electrical conductivity in excess of 1 ~~3~~ S/m, and the largest dimension of the ~~relatively non-volatile conducting~~ liquid exposed to ~~a~~ the low pressure ~~environment~~ region is smaller than 20 micrometers ~~μm~~.

11. (Currently amended) An apparatus as in claim 9, wherein said apparatus produces ~~operating as a source~~ primarily ~~of~~ ions, and wherein ~~where~~ said liquid at said controlled temperature is an ionic liquid, or a mixture including an ionic liquid, ~~with~~ and said liquid has an electrical conductivity in excess of ~~3~~ 1 S/m.

12. (Currently amended) An apparatus as in claim 11, wherein said apparatus produces ~~operating as a source~~ primarily ~~of~~ heavy ions, wherein ~~where~~ either the anions or the cations composing said ionic liquid have mass/charge ratios in excess of 300 ~~500~~ Dalton.